	APOLLO HOSPITALS, SECUNDERABAD	HIC – 08
		Issue: C
	STANDARD OPERATING PLAN ON BIOMEDICAL WASTE MANAGEMENT	Date: 06-01-2017
		Page 1 of 37
PREPARED BY:  Dy. Medical Superintendent		APPROVED BY:  Chief Executive Officer

A waste management programme will work only if the entire staff of the hospital works together to develop an effective waste management system.

Waste management system will involve interaction, discussion etc, Waste Management Committee is constituted in which it (WMC) is headed by the CEO & members include VP-Operations, Medical Superintendent, a Waste Management Officer to assist along with a representative of the infection control committee, Nursing Superintendent and enthusiastic head of departments. The waste management officer is appointed to look after issuing of consumable, waste surveys and recycling & for implementation and sustenance of the scheme at the Hospital. The waste manager will be the nodal person for all affairs to do with the waste management programme including interaction with the prescribed authority.

#### **Authorization by Pollution Control Board**

The Bio-medical Waste ( Management & Handling) Rules, 1998, make it mandatory for all healthcare establishments to obtain Authorization to generate, collect, transport, treat receive or dispose waste from the prescribed authority. E.g. the Prescribed Authority for Andhra Pradesh is the Member Secretary, Andhra Pradesh Pollution Control Board. The Hospital has to submit an application for an authorization form, fill in the details, and submit it to the Prescribed Authority along with the prescribed fee for grant of authorization.

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	APOLLO HOSPITALS, SECUNDERABAD	HIC – 08
		Issue: C
	STANDARD OPERATING PLAN ON BIOMEDICAL WASTE MANAGEMENT	Date: 06-01-2017
		Page 2 of 37
PREPARED BY:  Dy. Medical Superintendent		APPROVED BY:  Chief Executive Officer

## WHAT IS HOSPITAL WASTE AND FAMILIARIZATION WITH THE BIO-MEDICAL WASTE

### (Management & Handling) Rules, 1998

#### Hospital waste – Some definitions

- Hospital waste means all waste coming out of hospital out of which around 85% is actually non-hazardous waste, around 10% is infectious waste and around 5% is non-infectious but hazardous waste.
- Infectious waste includes all kinds of waste that may transmit viral, bacterial or parasitic diseases to human beings.
- Pathological waste includes human tissues, organs and body parts and body fluids that are removed during surgery or autopsy or other medical procedures, and specimens of body fluids and their containers.

#### SALIENT FEATURES OF THE BIO-MEDICAL (MANAGEMENT AND HANDLING) RULES 1998

1. Definition of Bio-medical waste  
Bio-Medical Waste means any waste which is generated during the diagnosis, treatment or immunization of human beings or in research activities pertaining thereto or in production or testing of biological. (Preparation from organism or micro-organism or product of metabolism and bio chemical reactions intended for use in diagnosis, immunization or treatment)
2. Occupier  
An occupier in relation to any institution generating Bio-medical waste (hospital, nursing home, clinic dispensary, veterinary institute, animal house, pathological laboratory, blood bank...) means the person who has control over that institution and its premises.
3. Operator  
Operator of a bio-medical facility means a person who owns or controls a facility for the collection, reception, storage, transport, treatment, disposal or any other form of handling bio-medical waste.

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QUALITY DEPARTMENT**

	APOLLO HOSPITALS, SECUNDERABAD	HIC – 08
		Issue: C
	STANDARD OPERATING PLAN ON BIOMEDICAL WASTE MANAGEMENT	Date: 06-01-2017
		Page 3 of 37
PREPARED BY:  Dy. Medical Superintendent		APPROVED BY:  Chief Executive Officer

#### **What the Bio-medical Waste (BMW) Rules outline:**

Application – These rules apply to all persons who generate, collect receive, store, transport, treat, dispose or handle bio-medical waste in any form.

Duty of the Occupier – The rules outline that it is the duty of every Occupier of an institution generating Bio-medical waste to take all steps to ensure that waste is handled without any adverse effect to human health and environment.

Get Authorization – Every Occupier of an institution generating, collecting, receiving, storing, treating, transporting, disposing and handling waste in any manner must make an application (Form – 1, BMW Rules) to the prescribed authority for grant of Authorisation. The Prescribed Authority is the Member Secretary. Andhra Pradesh Pollution Control Board.

Categories of Bio- Medical waste – The rules outline 10 categories of bio- medical waste and lays down the methodology for treatment and disposal of waste in these categories.

Segregation – The BMW Rules lay down the following color coding for segregation of bio-medical waste.

Treatment & Disposal – The rules emphasize that every Occupier shall set up in accordance with the time schedule, requisite bio-medical waste treatment facilities or ensure treatment of waste at a common facility or any other waste treatment facility.

Packing, transport and storage – the rules specifically outline that bio-medical waste must not be mixed with other waste and therefore segregation must be done properly. Besides, if the container / bag is transported outside the premises, the same should be sealed and labeled as prescribed in Schedule IV of BMW Rules.

#### **OTHER MANDATORY REQUIREMENTS AS PER BMW RULES, 1998**

- 1) Annual Report – Every Occupier / Operator must submit an annual report to the prescribed authority in the format specified by the rules by 31<sup>st</sup> January each year. The prescribed

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	APOLLO HOSPITALS, SECUNDERABAD	HIC – 08
		Issue: C
	STANDARD OPERATING PLAN ON BIOMEDICAL WASTE MANAGEMENT	Date: 06-01-2017
		Page 4 of 37
PREPARED BY:  Dy. Medical Superintendent		APPROVED BY:  Chief Executive Officer

authority in turn shall send all this information in a complied form to the Central Pollution Control Board by 31<sup>st</sup> of March each year.

- 2) Maintenance of Records – Every authorized person as per the rules will have to maintain records relating to the generation, collection, storage, transportation, treatment, disposal and any other form of handling waste. These records are subject to inspection / verification at any time by the prescribed authority.
- 3) Accident Reporting – if any accident occurs at any time at any institution where bio-medical waste is being handled or during transportation, the authorized person is required to report it as per Form III, of BMW Rules to the prescribed authority.
- 4) Labeling of bags – The rules make it mandate for all waste bags to be labeled with the details of the waste category, name and address of the sender and the receiver.
- 5) Use of symbols
- 6) Transportation of Waste – Untreated bio-medical waste shall be transported only in such vehicles as may be authorized for the purpose by the competent authority as specified by the Government and notwithstanding anything contained in Motor Vehicles Act, 1988.
- 7) Storage of waste – No untreated bio-medical waste shall be kept beyond a period of 48 hrs. If it becomes necessary to store the waste beyond such period, the authorized person must take permission from the prescribed authority and take measures to ensure that the waste does not adversely affect human health and environment.
- 8) Deadlines

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QUALITY DEPARTMENT**

	APOLLO HOSPITALS, SECUNDERABAD	HIC – 08
		Issue: C
	STANDARD OPERATING PLAN ON BIOMEDICAL WASTE MANAGEMENT	Date: 06-01-2017
		Page 5 of 37
PREPARED BY:  Dy. Medical Superintendent		APPROVED BY:  Chief Executive Officer

## GETTING TO KNOW WASTE – IDENTIFYING WASTE

The beginning of any waste management plan begins with identifying the areas that generate waste in the Hospital waste generated in almost all departments, wards, OPD, OT, ICU, Nursing Stations, Kitchen lab etc.

Keeping in view that a beginning has to be made, waste is classified into two basic categories viz.,

- a) Infectious
- b) Non- infectious

What is infectious waste?

Pathological waste including tissues, organs, blood and body fluids. Syringes, IV tubing, blood bags and other items contaminated with blood and body fluids. Items such as plaster, casts, which may be defined as infectious waste only when contaminated by blood and pus. Human anatomical or surgical waste. Waste from isolation wards etc. Spittoons, pathological specimens, waste from microbiological labs, cultures, media body excretions. Needles IV Canulas, Cotton, swabs, Bandages, mops etc.


What is non infectious waste?

Non-infectious waste constitutes nearly 85% of the entire HCE waste generated. It is similar to household waste. Non infectious waste is broadly classified into:

Kitchen Waste

Food  
 Peels  
 Natural Kitchen waste  
 Tea cups  
 Foil/ plastic  
 Fruit and vegetables leftovers

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**QUALITY DEPARTMENT**

	APOLLO HOSPITALS, SECUNDERABAD	HIC – 08
		Issue: C
	STANDARD OPERATING PLAN ON BIOMEDICAL WASTE MANAGEMENT	Date: 06-01-2017
		Page 6 of 37
PREPARED BY:  Dy. Medical Superintendent		APPROVED BY:  Chief Executive Officer

General Office Waste  
Wrapping paper  
Office papers  
Cartons  
Packing material  
Plastic sheets  
Bouquets  
Newspaper etc.


Kitchen waste is further divided into two categories:

1. Bio-degradable waste, which includes peels, left over food, vegetable skin, tea dregs and other natural kitchen waste.
2. Non-biodegradable waste is that waste that is essentially man-made like foil, plastic or thermocol cups, plastic paper, wrapping etc.

**CLASSIFICATION OF BIO-MEDICAL WASTE AS PER BMW RULES**  
**THE BMW RULES CLASSIFY WASTE INTO 10 DIFFERENT CATEGORIES.**


Cat – 1 Human anatomical waste	Cat – 2 Animal waste
Cat – 3 Micro- biology and bio-technology waste	Cat – 4 Waste sharps
Cat – 5 Discarded medicines and cytotoxic drugs	Cat – 6 Soiled waste

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**QUALITY DEPARTMENT**

	APOLLO HOSPITALS, SECUNDERABAD	HIC – 08
		Issue: C
	STANDARD OPERATING PLAN ON BIOMEDICAL WASTE MANAGEMENT	Date: 06-01-2017
		Page 7 of 37
PREPARED BY:  Dy. Medical Superintendent		APPROVED BY:  Chief Executive Officer

Cat – 7 Solid waste	Cat – 8 Liquid waste
Cat – 9 Incineration Ash	Cat – 10 Chemical waste

**CONTROLLED COPY**  
**QUALITY DEPARTMENT**

	APOLLO HOSPITALS, SECUNDERABAD	HIC – 08
		Issue: C
	STANDARD OPERATING PLAN ON BIOMEDICAL WASTE MANAGEMENT	Date: 06-01-2017
		Page 8 of 37
PREPARED BY:  Dy. Medical Superintendent		APPROVED BY:  Chief Executive Officer

## SEGREGATION OF WASTE

Segregation is a very important element in a waste management system. Segregation means to separate or divide. Separating waste especially infectious from non-infectious at source of generation is very important. A good segregation plan is one where segregation happens at source and there is proper containment of waste.

A good way of doing this is segregating waste in different containers by colour codes

How to Segregate:

1. The first step is to define the categories of segregation. The BMW Rules call for segregation on the basis of colour codes.


Colour code	Type of container	Waste category	Treatment/Disposal
Yellow	Plastic – Non – chlorinated bag	Cat.1, Cat.2, Cat.3 and cat.6	Incineration / Deep Burial
Red	Disinfected container / Plastic bag	Cat 3, 6 and cat. 7	Autoclaving / Microwaving / chemical treatment
White Translucent	Plastic bag /Puncture proof container	Cat. 4 and Cat.7	Autoclaving/ Microwavin/ Chemical treatment and destruction and shredding
Black	Plastic bag	Cat 5, 9, 10 ( Solid)	Disposal in secured landfill

2. A good way of beginning is by making a list of all those items that will go into each segregation category.

3. Placement of containers for segregation is important. The bins are placed in such a way that they match the colors chosen for segregation. For e.g a red bin with a red bag is easy to remember. Also it

**CONTROLLED COPY**  
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	APOLLO HOSPITALS, SECUNDERABAD	HIC – 08
		Issue: C
	STANDARD OPERATING PLAN ON BIOMEDICAL WASTE MANAGEMENT	Date: 06-01-2017
		Page 9 of 37
PREPARED BY:  Dy. Medical Superintendent		APPROVED BY:  Chief Executive Officer

must be ensured that all bins must be line with bags and must also have the bio hazard symbol. The type, placement and size of the container are usually based on the waste stream in that area.

4. In addition to the above, it is recommended that another colour like green be added for general waste.

Segregating with ease

1. It is mandatory to segregate waste as per the BMW Rules. Hospital policy regarding disposal of certain kinds of waste, for example a centralized policy for disposal of contaminated drugs, date expired or cytotoxic drugs and also solid chemicals must be returned to a central place from where they will be disposed. This helps the hospital both ways in terms of convenience and also in saving cost.
2. Returning items like IV bottles, used x-ray films, cartons to the store must be carried out. All these are non-infectious and can be recycled thereby generating some funds that can come handy for the waste management system.

## DEALING WITH WASTE – HANDLING WASTE


### Safety first

Waste can be hazardous; therefore it needs to be handled very carefully. Injuries caused by needles are called Needle – stick injuries.

Categories of staff exposed to needle stick injuries

Staff nurses Interns Residents Technical staff
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QUALITY DEPARTMENT**

	APOLLO HOSPITALS, SECUNDERABAD	HIC – 08
		Issue: C
	STANDARD OPERATING PLAN ON BIOMEDICAL WASTE MANAGEMENT	Date: 06-01-2017
		Page 10 of 37
PREPARED BY:  Dy. Medical Superintendent		APPROVED BY:  Chief Executive Officer

Procedures capable of causing needle stick injuries

Procedures
Drawing blood
Recapping Needles
Needle disposal
Garbage disposal

### **Safety Protective gear**

Appropriate safety protective gear must be used to reduce risk of worker exposure. The Hospital must provide appropriate specialized clothing or equipment to protect against exposure to blood and other potentially infectious materials.

Safety gear consists of gloves, face shields, masks, and eye protection, gowns, aprons. It must be ensured that appropriate personal protective equipment is used and used correctly. The waste management officer must also ensure that personal protective equipment is properly cleaned, laundered, repaired, replaced, or disposed as needed, at no cost to the employee.

The waste management officer must ensure that employees observe precautions for handling and using personal protective equipment, including.

Removal of garments must be done that has blood and other infectious material as soon as possible.

Placing contaminated protective equipment in designated areas or containers for storing, washing, decontaminating, or discarding each day or shift.

Replacing gloves if torn, punctured, contaminated or if their ability to function as a barrier is compromised.

Utility gloves may be decontaminated for re-use if the integrity of the glove is not compromised. However, they must be discarded if they are cracked, peeling, torn etc.

**CONTROLLED COPY**  
**QUALITY DEPARTMENT**

	APOLLO HOSPITALS, SECUNDERABAD	HIC – 08
		Issue: C
	STANDARD OPERATING PLAN ON BIOMEDICAL WASTE MANAGEMENT	Date: 06-01-2017
		Page 11 of 37
PREPARED BY:  Dy. Medical Superintendent		APPROVED BY:  Chief Executive Officer

Wearing appropriate face and eye protection such as goggles, glasses with solid side shields or chin-length face shields when splashes, sprays, spatters, or droplets of infectious materials pose a hazard to the eyes, nose or mouth.

Protective clothing is a MUST for those who generate waste ( Doctors, Sisters and Lab Assistants) and those who handle waste ( Ward boys, Para-medical staff, Housekeeping personnel, etc.)

### **Handling infectious waste**

Handling of infectious waste is very crucial in any waste management system. The objective being minimum handling of infectious waste. This is possible if segregation is done at source. Transfer and repeated collection from one container to another vastly increases the risk to every waste handle and health worker.

For the purpose, infectious waste must be kept separately in lidded bins with plastic bags. Under no circumstances should the infectious waste be mixed with non-infectious waste.

Similarly all bags containing infectious waste must be tied securely and labeled describing the waste category and also have the international bio-hazard symbol. Proper colour coding and labeling minimizes confusion in handling and disposal of waste.

### **Handling disposables**

All Rubber / plastic disposables must be mutilated / cut before disposal. For e.g. the fingers of gloves must be cut, needles and syringes must be cut in the needle cutter/ burner. Catheters and tubing's must be cut IV bottles punctured etc. This reduces any chances of illegitimate reuse. However blood bags should never be cut or punctured. Minimal handling is advocated in this case.

### **Handling Sharps**

Types of sharps – The most commonly used sharps include single / multiple use hypodermic needles, syringes, pastuer pipettes, scalpel blades, blood vials, test tubes, needles with attached tubing's and

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